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ALTAMAHA.—Yellow River, Ga., from its mouth near Worthville to near Yellow River, 57.3 miles.

ALTAMAHA.—Towilaga River, Ga., 21.7 miles, from near Berner to High Falls.

CHATTAHOOCHEE.—Soque River, Ga., 8.8 miles, from its mouth near View to Clarksville.

CHATTAHOOCHEE.—Chattahoochee River, Ga., 64.7, miles, from Chattahoochee to Franklin, and from near Chestatee to near Santee, 55 miles, and from near West Point to near Columbus, 35 miles.

CHATTAHOOCHEE.—Chestatee River, Ga., 47.7 miles, from Willow to its mouth near Chestatee.

SAVANNAH.—Chattooga River, Ga., S. C., 29.3 miles, from its mouth near Tallulah Falls to near Russell, S. C.

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## GEOGRAPHICAL RECORD.

### AMERICA.

THE PAN-AMERICAN RAILROAD.—Marked progress is being made towards carrying out the Pan-American railroad project. Mr. Charles M. Pepper, Special Commissioner appointed by President Roosevelt, has returned from his visit to the Latin-American Republics. He found a very friendly disposition on the part of the various countries, some of which have adopted special legislation in the interest of the intercontinental railroad connection. Several countries are building railroads along the lines of the intercontinental surveys, while in other countries concessions have been made with this special end in view. His full report will be issued in a short time. (*Bull. of the International Bureau of Amer. Reps.*, February, 1904.)

THE DELTA OF SAINT CLAIR RIVER.—The fact that the St. Clair River, flowing out of one of the Great Lakes, (Lake Huron,) has built a fairly large and quite broad delta where it emerges into Lake St. Clair, has been the cause of much wonder on the part of those who have seen and have become familiar with its existence by the map, but have no knowledge of its immediate surroundings and causes. This delta has recently been made the subject of a paper by Cole, published by the Michigan Geological Survey (Vol. 9,

Part I). In this paper the author has made a study of the materials composing the delta, and also of the causes for its development in this peculiar situation. Normally, an outflow from a large lake should be free from sediment, and therefore incapable of building a delta in the brief period of time which has elapsed since the withdrawal of the glacier from this region. One reason why this delta has been possible in Lake St. Clair is the shallowness of the lake itself, thus requiring but a small accumulation of sediment to build the delta up above the lake level. It has been found by borings that the delta rests upon the older clay at a depth of from 14 to 16 feet. A second reason why the delta has been possible here is the drift of wind-formed currents along the shore of Lake Huron toward the St. Clair outlet. These currents, driven before the prevailing west winds, furnish a supply of sediment which, under other conditions, would not be present in the outflow of a large, deep lake. The time required for the formation of this delta is estimated by Cole to be somewhere between five and ten thousand years, and the time necessary for the completion of the filling of Lake St. Clair to be between twenty and forty thousand years. R. S. T.

CLIMATE OF PANAMA.—The climate of the Isthmus of Panama is distinctly tropical in character. The width of the isthmus is so slight (about 40 miles) and the continental divide so low (but little more than 300 feet above mean sea-level) that the Atlantic and Pacific necessarily affect the climate in a very marked way, the winds blowing across the entire isthmus almost unobstructedly. The marked characteristic of the climate as a whole is its prevailing uniformly high temperature and great humidity, the combination of the two giving the "hot-house" quality to the air which northerners find so depressing and enervating. At Colon the temperature does not often rise above 90° Fahr., although it has exceeded 98°. The usual monthly maximum temperatures range from about 85° to 91° or 92°. The mean monthly minimum temperature is but little below 70°. The mean annual temperature is about 80°. For ordinary purposes there is no noteworthy difference in temperature between the Atlantic and Pacific sides of the isthmus, but there are marked differences in the rainfall. The point about the Isthmian climate, as in the case of other moist tropical climates, is not that the dry-bulb temperatures are excessively high, but that the heat is continuous throughout the year, and that this heat is not dry, but moist. The seasons on the isthmus are not divided according to differences of temperature, as with us, because

these differences are so slight, but, as elsewhere in low latitudes, they are based on the distribution of precipitation. The dry season extends from January to April, although this does not mean that absolutely no rain falls then, and the wet season extends from May to December. The Colon side has a good deal heavier precipitation than the Panama side, the mean at Colon being about 125 to 130 inches, and at Panama a little over 65 inches. Most of the foregoing facts are based on an article by Hon. Wm. H. Burr, in the *National Geographic Magazine* for February. R. DEC. W.

METEOROLOGICAL STATION ON THE ISLAND OF AÑO NUEVO.—The Argentine Republic has decided to give a permanent character to the first-class meteorological and magnetic observatory on the Island of Año Nuevo, in the vicinity of Staten Island, Lat.  $54^{\circ} 39'$  south, Long.  $64^{\circ} 07' 30''$  west. This observatory was established in order that observations might be taken there in connection with the International Antarctic Expedition. The island is small and elevated but little above sea-level, and the observatory is erected under excellent conditions at a distance of only six miles from the mountains of Staten Island. It is equipped with the complete instrumental outfit appropriate to a first-order station. At the end of the present year the observatory will begin to publish the results obtained during the International Antarctic Expedition, and also the observations of the current year. This observatory, and the new one proposed for Bahia Blanca, will form part of the system of observatories on the Atlantic Coast of Argentina under the supervision of the Argentine Ministry of Marine.

R. DEC. W.

#### EUROPE.

SURVEYS OF SCOTTISH LAKES.—The second report of Sir John Murray and Mr. Pullar on their surveys of the Scottish lakes (*Scot. Geog. Mag.*, Nov., 1903) is devoted to the lochs of the Tay basin. The largest and deepest of the lakes described is Loch Tay, whose greatest depth, as far as ascertained, is 508 feet. The trough form of lake beds is everywhere found, but in many of the lakes are several deep troughs, separated from one another by flat-topped elevations of the lake bottom. No explanation is given of the observed fact that the greatest depths are often found in the upper part of the lake.

ICELAND WEATHER AND THE WEATHER OF NORTHWESTERN EUROPE.—Hann has recently investigated the anomalies in the

weather of Iceland during the period 1851-1890, and their relations to simultaneous anomalies in the weather of northwestern Europe (Akad. Wiss. Wien, math.-naturwiss Kl., Jan. 7, 1904). As a basis for this study there are taken the monthly and annual mean temperatures and pressures, at Stykkisholm, for the period from 1846 to 1900, and the precipitation for 1857 to 1900. From these data the departures of the monthly means of these different elements from their 50-year means are determined. These departures are compared with the temperature departures at Greenwich, Brussels, and Vienna for the same period. Further, the departures of pressure and rainfall at Brussels and of the pressure at Vienna were determined, but partly for the winter only. The general results are as follows: For the three winter months the pressure departures in northwestern and in central Europe are, in 70 per cent. of the cases, the opposite of those at Stykkisholm at the same time. In the case of temperature the probability of an opposite condition is only 0.56. When the pressure departure of a month at Stykkisholm is negative, the probability of a simultaneous positive departure in the temperature of northwestern and central Europe is 0.82. When the pressure departure is positive, the probability of a negative temperature departure is 0.73. In winter every considerable pressure departure in Iceland involves, with a probability of 0.86, a temperature departure in the opposite sense in northwestern Europe; in summer the probability is 0.70. As the result of this study, there is strong evidence that the mild climate of northwestern Europe, and even of central Europe, is, in the first instance, dependent upon the Iceland barometric minimum.

Hann has further investigated the relations between the simultaneous pressure anomalies at Ponta Delgada (Azores) and at Stykkisholm, *i. e.*, in the two great "centres of action" of the atmosphere, as de Bort has called the permanent High near the Azores and the Low near Iceland, and finds that there is a certain interdependence between them. When the pressure at the Azores is above the mean, and the pressure at Iceland is below it, the normal pressure gradient over the Atlantic is increased; the atmospheric machine runs more quickly, and the favourable climatic conditions of Europe are accentuated. The cases of exceptionally high pressure near the Azores, and of exceptionally low pressure near Iceland at the same time, are a consequence of an increased activity of the atmospheric circulation. When the northeast trade is stronger than usual the high pressure to the right is intensified; the great whirl in the North Atlantic is increased, and the pressure at its

centre, near Iceland, is decreased. Thus the opposite pressure anomalies in the Azores and near Iceland may be related as cause and effect.

R. DEC. W.

#### AFRICA.

**ECONOMIC RESOURCES OF SOUTH ANGOLA.**—Mr. H. Baum's report on the results of the expedition sent out in 1899 by the German Kolonial-Wirtschaftliches Komitee to examine the economic resources of South Angola shows that the expedition was most fruitful in results. No other party has brought back from West Africa a richer harvest of botanical data. The country traversed is one of the least known parts of Africa. The route led from Mossamedes to the Kunene, and up an eastern tributary of the latter to the upper Kubango. This stream was followed down for about 200 miles, after which the route led northeast to the Kuito and thence east to the upper Kuando, and back to the coast by a more northerly route.

Particular attention was given to the rubber-yielding plants, most prominent among which is *Carpodinus chylorrhiza*, whose roots are dug up to obtain the product. It grows in open sandy tracts. The method of preparing the caoutchouc is fully described and illustrated. The most characteristic tree of the region is the *Berlinia Baumii*, the best fibres of which are largely used for cordage, etc., while the bark serves to make boats. The fertile districts near the coasts are well adapted for cotton cultivation, though at present only sugar-cane is grown. The soil of the interior plateau is capable of growing our cereals, vegetables, and fruits. The timber supply is generally abundant, but the principal value of South Angola is its fine adaptability for cattle-raising.

**MEDUSÆ IN VICTORIA NYANZA.**—It will be remembered that Mr. J. E. S. Moore advanced the view that the fauna of Lake Tanganyika differs from that of the other East African lakes in alone possessing evidences of a marine origin. But *Nature* records (No. 1789) the independent discovery by British and French investigators of marine medusæ in Victoria Nyanza similar to those of Lake Tanganyika. *Nature* expresses the opinion that this fact cannot be without its effect upon the acceptance of Mr. Moore's view. Mr. Moore, however, has written a letter to that periodical (No. 1790), in which he says that this jelly-fish may have existed in Victoria Nyanza from all time, in which case we have a confirmation of his view that the ancient sea, from which the halolimnic "relic" sprang, spread much further towards the east than was at first sup-

posed. He thinks it is quite possible, however, that the medusæ have been recently transported to the Victoria Lake from Tanganyika owing to the opening up of the new trade routes.

#### ASIA.

THE CHINESE PUSHING NORTHWARD.—Mr. C. W. Campbell, in a paper on his Mongolian Journeys (*The Geog. Jour.*, Nov., 1903), says that as the pressure of population in Shansi and Chili increases swarms of Chinese spread beyond the Great Wall and are gradually colonizing all the mountains which form the broad staircase to the high plains of inner Mongolia. The immigrants are also encroaching on the plains. He found in 1899 that the Chinese settlers had reached a mile or so beyond Chagan-balgas, which is about ten miles north of the Great Wall. Three years later he found them ploughing the virgin turf ten miles farther north.

He says that the contrast between the plain of Chili, on which Peking stands, and the steppes of Mongolia, separated from the plain by the mountain tract, about 100 miles wide, north of Peking, is very great. The vast alluvial plain of Chili (larger than England) is sown so thickly with towns and villages that the traveller is rarely a mile away from a settlement. The plain is as flat as a floor, and is very little above sea-level. The steppes and downs of Mongolia, on the other hand, are 4,000 feet above sea-level, and have hardly as many inhabitants as there are villages in Chili. The Chinese province is a great grain field; while cultivation is almost unknown in Mongolia, except on the southern border and along a part of the Siberian frontier.

PORT ARTHUR.—Port Arthur, now prominent in public attention, stands in the southeastern extremity of the Liau-tung peninsula, just outside the southern limit of winter ice, this immunity being one of its most valuable features. The harbour is an oval inlet of the sea, two miles long from east to west and a mile from north to south; it is surrounded by hills of varying elevation, and its sole entrance is on the southern side by a narrow channel, guarded at the southwestern end by a couple of dangerous reefs and protected against bad weather by a narrow spit of rocky land, known as the Tiger's Tail. The harbour was so shallow, until it had been dredged, that no large vessel could enter; even now there are berths for but three battleships, in addition to smaller craft. For this reason the larger part of the Russian fleet has been forced to lie outside the heads of the channel or else enter the larger wet dock which lies to the east, facing the entrance to the harbour

proper. The width of the entrance from Pinnacle Rock on the west to the opposite shore is barely 350 yards. Within these heads the channel widens somewhat.

ZYBIKOV'S VISIT TO LHASSA.—Mr. Zybikov, the Buddhist and Buriat subject of Russia, who was sent to Tibet in 1899 by the St. Petersburg Geographical Society, has published in the *Izvestia* a report of his journey. Though his paper gives little information about Lhasa not found in Chandra-Das's book or the recent recital of Baza Bakchi, it contains some hitherto unpublished details. He says that Lhasa appears to be more populous than it really is, because of its large floating population of merchants and pilgrims. The number of fixed inhabitants is about 10,000, of whom nearly 6,500 are women. Throughout Tibet commercial pursuits are largely monopolized by the Chinese. Nearly all of them have Tibetan wives, who are very proud of their alliance with the Chinese, and are the intermediaries between the merchants and the petty local traffickers. The Nepalese residents are merchants or artisans, who, though Buddhists, do not marry Tibetan women, as the laws of their country prohibit these unions. On the other hand, natives of Kashmir contract marriages with women of Tibet after having previously converted them to Mohammedanism.

#### POLAR.

THE ANTARCTIC EXPEDITION.—Prof. Penck of Vienna has been publishing a series of popular scientific articles in the *Neue Freie Presse* on the latest Antarctic expeditions, which he believes to have accomplished very important results, though some time must elapse before the full value of the work done can be estimated. He says that while Ross looked on the Great Barrier as the wall of an extensive area of thick pack ice, the journey of Capt. Scott made it clear that it was the edge of a vast glacier, not less than 700 miles wide, which reached the sea by a great plain between the mountains of Victoria Land and Edward VII Land. If d'Urville and Wilkes were not always sure whether they saw land or merely the edge of ice masses, Drygalski has proved the existence of a completely ice-covered land in the far south, resembling in its character as to ice and snow the interior of Greenland. These voyages have made it clear that there is a seventh continent around the South Pole, how large we cannot yet tell, but probably larger than Europe. Prof. Penck thinks that Antarctica is the preferable name for this continent. He also shows that the meteorological



results are in harmony with the theory of an extensive continent. (*The Geog. Jour.*, Feb., 1904.)

SHOWING VEGETATION ON MAPS.—In his address before the Geographical Section of the British Association Meeting at Southport, Dr. W. G. Smith, of Yorkshire College, discussed the value of observing features of vegetation in geographical exploration. The vegetation of a country is, after its configuration, the most important factor in a landscape. Considerable progress has been made in representing the vegetation of countries on maps. This is done by recording the limits of distribution of the most abundant or dominant plants, such as trees. The vegetation of considerable parts of Europe and North America has been charted. The detail in simple cases shows the region of deciduous trees as distinct from that of conifers and the forest lands as contrasted with treeless areas. Maps with greater detail are now being issued in Great Britain. Vegetation charts of all parts of the earth would be a distinct gain to plant-geography.

ATMOSPHERIC PRESSURE AS A CLIMATIC FACTOR.—In *Symons's Meteorological Magazine* for February, L. Bonacina lays emphasis upon the importance of "Atmospheric Pressure as a Factor of Climate." The British Isles, for example, owe their mild climate to the fact that their winds are chiefly from warm ocean waters, but the power of these warm waters to raise the temperature of the islands depends upon the distribution of pressure. The pressure is nominally low, especially in winter, near Iceland, and the gradients thus produced naturally strengthen the prevailing westerly and southwesterly winds. When the pressure is markedly anticyclonic over the British Isles, the influence of the warm waters is largely kept out, and severe frosts may occur, even in Ireland. The configuration of the isobars is thus an important factor in the climate of western Europe.  
R. DEC. W.

CLIMATE AND THE COTTON-BOLL WEEVIL.—Dr. L. O. Howard considers "The Mexican Cotton-Boll Weevil" in the February *Review of Reviews*, and notes several points in which there is a climatic relation. Although this insect has its natural home in tropical America, it has greatly multiplied and spread within the limits of the United States, being one of but two or three tropical insects which have done this. The weevil first spread northward in Texas partly because carried in the cotton to the gins farther north, and partly because it flew northward, aided by the prevailing southerly winds of summer and autumn. The boll-weevil in-

creases very rapidly from spring until fall, and by the end of October the pest is at its worst; "in badly-infected regions there are weevils for every boll of cotton in the fields." It has been found that one effective way to make headway against this pest is to plant northern seed, which, being accustomed to a shorter summer, develops rapidly, so that the crop may be picked before October, *i. e.*, before the weevils are at their maximum development. Further, as the weevils like shade, the seed is now being planted in rows a good deal farther apart than formerly. These new methods, which are the result of the studies made by the Department of Agriculture, are gradually being adopted by the Texas cotton planters.

R. DEC. W.

FAIRCHILD ON CHAMBERLAIN'S PLANETESIMAL HYPOTHESIS.—A paper read by Prof. Fairchild before the St. Louis meeting of the Geological Society of America is republished in a recent number of the *American Geologist* (XXXIII—1904, 94-116). In this paper there is not a full statement of Prof. Chamberlain's hypothesis, but an assumption that it has displaced the time-honoured nebular hypothesis. Starting with this fundamental assumption, Fairchild shows how, according to his views, the new hypothesis fits better into the explanation of a large range of geological phenomena, including such topics as the origin of hydrocarbons, metalliferous deposits, gypsum and salt deposits, mountain formation, and volcanic action, the origin of the ocean and the atmosphere, etc. The speculative conclusions which the author draws will appal most of the conservative geologists, who have been in the habit of clinging to the old. Fairchild's paper will probably not convince many of this class, but it may serve the purpose of leading them to look more carefully at Chamberlain's hypothesis, now that its application to geology is brought forward so prominently. Without taking much more space than is available here, it would be quite impossible to abstract Fairchild's paper with any degree of satisfaction, but any one who is interested in speculative philosophy will find this paper well worth study. Such reading will bring to many persons a decided shock, to see the old geology relegated to the background and the new confidently put in its place. It may be stated that most geologists will not be ready to accept this result until the planetesimal hypothesis itself is shown to have a more rational foundation than the nebular hypothesis; but in this age of startling scientific discovery and advance, one would have no right to look sceptically upon even such advanced ideas as those Fairchild has put forward.

R. S. T.